CLAIMS

1. An 3-α-glycosyl α,α-trehalose which has an α-glucosyl α,α-trehalose structure, represented by the chemical formula 1, intermolecularly.

Chemical formula 1:

O*-α-D-Glc*p*-(1→3)-*O*-α-D-Glc*p*-(1→1)-α-D-Glc*p

2. The 3-α-glycosyl α,α-trehalose of claim 1, wherein said 3-α-glycosyl α,α-trehalose is 3-isomaltosyl α,α-trehalose represented by the chemical formula 2.

Chemical formula 2:

O*-α-D-Glc*p*-(1→6)-*O*-α-D-Glc*p*-(1→3)-*O*-α-D-Glc*p*-(1→1)-α-D-Glc*p

3. The 3-α-glycosyl α,α-trehalose of claim 1, wherein said 3-α-glycosyl α,α-trehalose is 3-α-glucosyl α,α-trehalose represented by the chemical formula 3.

Chemical formula 3:

O*-α-D-Glc*p*-(1→3)-*O*-α-D-Glc*p*-(1→1)-α-D-Glc*p

4. A method for forming 3-α-glycosyl α,α-trehalose of any one of claims 1 to 3, which comprises a step of allowing α-isomaltosyl-transferring enzyme to act on an aqueous solution comprising α,α-trehalose and a saccharide having a glucose polymerization degree of 3 or higher and bearing both the α-1,6 glucosidic linkage as a linkage at the non-reducing end and the α-1,4 glucosidic linkage other than the linkage at the non-reducing end.

5. The method of claim 4, wherein said saccharide is prepared by allowing α-isomaltosylglucosaccharide-forming enzyme to act on

partial starch hydrolyzates.

6. The method of claim 4 or 5, which further comprises a step of allowing glucoamylase to act on the reaction mixture.

7. A method of forming α-glycosyl α,α-trehalose, which comprises the step of allowing a saccharide-transferring enzyme to act on an aqueous solution comprising 3-α-isomaltosyl α,α-trehalose represented by the chemical formula 2 and/or 3-α-glucosyl α,α-trehalose represented by the chemical formula 3 and optional other saccharides to form said α-glycosyl α,α-trehalose of claim 1.

8. A process for producing 3-α-glycosyl α,α-trehalose of claim 2, which comprises the steps of:

allowing α-isomaltosyl-transferring enzyme to act on an aqueous solution comprising α,α-trehalose and a saccharide having a glucose polymerization degree of 3 or higher and bearing both the α-1,6 glucosidic linkage as a linkage at the non-reducing end and the α-1,4 glucosidic linkage other than the linkage at the non-reducing end to form 3-α-isomaltosyl α,α-trehalose represented by the chemical formula 2; and

collecting the resulting 3-α-isomaltosyl α,α-trehalose.

9. The process of claim 8, wherein said saccharide is prepared by allowing α-isomaltosylglucosaccharide-forming enzyme to act on starchy substances.

10. A process for producing 3-α-glycosyl α,α-trehalose of claim 3, which comprises the steps of:

allowing α-isomaltosyl-transferring enzyme to act on an aqueous solution comprising α,α-trehalose and a saccharide having a

glucose polymerization degree of 3 or higher and bearing both the α-1,6 glucosidic linkage as a linkage at the non-reducing end and the α-1,4 glucosidic linkage other than the linkage at the non-reducing end to form 3-α-isomaltosyl α,α-trehalose represented by the chemical formula 2;

successively allowing glucoamylase to act on the resulting 3-α-isomaltosyl α,α-trehalose to form 3-α-glucosyl α,α-trehalose represented by the chemical formula 3; and

collecting the resulting 3-α-glucosyl α,α-trehalose.

11. A process for producing α-glycosyl α,α-trehalose, which comprises the step of:

allowing a saccharide-transferring enzyme to act on an aqueous solution comprising 3-α-isomaltosyl α,α-trehalose represented by the chemical formula 2 and/or 3-α-glucosyl α,α-trehalose represented by the chemical formula 3 and optional other saccharides to form α-glycosyl α,α-trehalose of claim 1; and

collecting the resulting α-glycosyl α,α-trehalose.

12. The process for producing α-glycosyl α,α-trehalose of any one of claims 8 to 11, wherein said α-glycosyl α,α-trehalose is collected by a column chromatography using a column packed with a salt-type strongly acidic cation exchange resin.

13. A composition which comprises α-glycosyl α,α-trehalose of any one of claims 1 to 3.

14. The composition of claim 13, where one or more ingredients selected from the group consisting of other non-reducing saccharides, reducing saccharides, sugar alcohols, and minerals are incorporated

into said α-glycosyl α,α-trehalose of any one of claims 1 to 3.

15. The composition of claim 13 or 14, which is in the form of a product for oral use, food and beverage, cosmetic, or pharmaceutical.